

REMARKS

By this amendment, applicants have amended the specification to delete reference therein to the claims and to insert appropriate headings. Applicants have amended the claims to delete the informalities therein noted by the Examiner in numbered section 2 of the office action and the alleged indefinite expressions noted by the Examiner in numbered sections 7 - 16 of the office action, as well as to delete the reference numerals in the claims. Applicants have added claims 10 - 16 to define further aspects of the present invention and have amended the abstract of the disclosure to be in proper format.

Applicants are submitting herewith a copy of the preliminary amendment filed October 6, 2000 and the drawing figure filed October 6, 2000, as well as the International Preliminary Examination Report and the notification from the International Bureau advising applicants that a copy of the translation of the International Preliminary Examination Report was transmitted to the Japanese and United States elected offices. Also enclosed is a copy of applicants' post card receipt evidencing receipt of the preliminary amendment and drawing figure in the United States Patent and Trademark Office on October 6, 2000.

The Examiner has objected to claims 5 - 9 under 37 CFR 1.75(c) as allegedly being in improper multiple dependent claim format. However, by the Preliminary Amendment of October 6, 2000, applicants amended claims 4 - 8 to eliminate the multiple dependent claim format. Accordingly, these claims should have been treated by the Examiner on the merits.

Noting the foregoing amendments to the claims, it is submitted all of the claims now in the application comply with the requirements of 35 USC 112, second paragraph. Therefore, reconsideration and withdrawal of the objection to claim 1 is

numbered section 2 and the rejection of claims 1 - 4 under 35 USC 112, second paragraph, in numbered section 7 of the office action are requested.

Noting the amendments to the abstract of the disclosure, reconsideration and withdrawal of the objection to the abstract in numbered section 3 of the office action are requested.

Noting the amendment to the specification adding the heading "Brief Description of the Drawing," reconsideration and withdrawal of the objection to the disclosure in numbered section 4 of the office action are requested.

Noting the attached drawing figure and applicants' post card receipt, it is submitted the requirement for new drawings on a separate sheet should be withdrawn. While applicants note the Examiner's suggestion to add a legend to the figure such as "Figure" or "Figure 1", applicants note that such a legend is prohibited by 37 CFR 1.84(u)(1).

Claim 1 stand rejected under 35 USC 103 as allegedly being unpatentable over United States Patent No. 5,138,971 to Nakajima et al in view of United States Patent No. 3,625,743 to Watanabe. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a device for moistening a material web moved in a transport direction. The device is preferably used for re-moistening of a paper or textile web dried after printing. The device includes a spray device for spraying a water fog onto to the material web under the influence of an electrostatic field generated by a device for electrostaticly charging. According to the present invention, a reversing roller is provided for reversing the material web upstream of the spray device. The reversing roller has, associated with it, a device for electrostatic charging designed as a corona-charging electrode. The spray device

has two water spray heads located on both sides of the material web. Applicants have found that using this device, surprisingly, the water particles of the spray mist are sucked by the material web to penetrate the material while the amount of applied water has not led to any formation of surface water on the material web. With this device, an efficiency of more than 95% and sometimes even 98% has been reached. In contrast to known devices, the device also has the advantage that significantly less components are required, thus, reducing the space requirements for the device. This is a particular advantage in terms of being able to retrofit existing pressure systems simply. See, e.g., the paragraph bridging pages 1 and 2 of applicants' specification.

The patent to Nakajima et al relates to a web charging apparatus for use in a coating system for applying various coating liquids onto a web which has been previously charged by a static field in which conductive wires form a corona discharge electrode. This patent discloses applying coating liquid 10 to a web 6 by a coating die 9. However, the coating die 9 applies the coating liquid 10 to the web 6 only on one side of the web. The coating die is not disclosed to include a spray head and clearly not spray heads located on both sides of the material web.

While the Examiner alleges that it would have been obvious to spray on both sides of the web, it is noted that to do so one could not use the device of Nakajima in which the coating die coats the coating liquid 10 on one side of the web 6 as it passes around a roller. Attempting to coat the other side of the web 6 would not be successful since the coating contacting the surface of the roller opposite coating die 9 would be destroyed.

The patent to Watanabe discloses electrostatically impregnating sprayed liquid particles onto a moving sheet of paper. However, the Watanabe patent does not

disclose the use of a corona-charging electrode for electrostatically charging the paper.

It is submitted that the Nakajima et al and Watanabe patents represent two different fields and that one skilled in the art to which the Watanabe patent pertains would not have looked to the Nakajima apparatus. Watanabe, like the present invention, relates to moistening a web, such as a paper web, while the Nakajima et al patent relates to applying a coating to the surface of one side of a web. The intended effects, and therefore, the means for providing those effects, are quite different.

As noted in the International Preliminary Examination Report (a copy of which was transmitted to the United States elected office and a copy of which is attached hereto for the Examiner's convenience):

The publications cited in the search report do not give a person skilled in the art any incentive to construct the charging device in a device according to US-A-3 625 743 (D1) for humidifying a conveyed material web in such a way that a device designed as a corona charging electrode is associated with the return roller for electrostatic charging. This measure results from a step that does not represent a logical development of the prior art cited. The device for humidifying a conveyed material web according to Claim 1 thus involves an inventive step.

For the foregoing reasons, claim 1 is patentable over the proposed combination of Nakajima et al and Watanabe.

While the Examiner has not treated claims 5 - 9 on the merits, it is submitted that the failure to treat these claims is improper in view of the preliminary amendment of October 6, 2000. In any event, the subject matter of the dependent claims is also neither disclosed nor suggested by Nakajima et al and Watanabe. Applicants note, especially, dependent claims 7 and 9 reciting the location of the corona-charging electrode and the fact that the two water spray heads are located

oppose one another on the two sides of the material web. These features are neither disclosed nor suggested by the proposed combination of Nakajima et al and Watanabe.

Applicants submit that added claims 10 - 16 are also patentable over the proposed combination of references.

Claims 2 - 4 stand rejected under 35 USC 103(a) as being unpatentable over Nakajima et al and Watanabe, and further in view of United States Patent No. 3,863,108 to Blythe et al. Applicants traverse this rejection and request reconsideration thereof.

The Blythe et al patent discloses a method and apparatus for controlling the electrostatic charge density on a surface by generating an ion current adjacent the surface, partially screening the surface from the generated ion current, and controlling the magnitude and sign of the ion current passing to the surface by means of an applied bias voltage. The Examiner has cited this patent as disclosing a chromium plated roller. However, clearly nothing in the Blythe et al patent remedies any of the basic deficiencies noted above with respect to Nakajima et al and Watanabe. Accordingly, claims 2 - 4 are patentable over the proposed combination of references, at least for the reasons noted above.

Applicants note the Examiner has cited a number of documents as being pertinent to applicants' disclosure. However, since these documents were not applied in rejecting claims formerly in the application, further discussion of these documents is deemed unnecessary.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 320.38785X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES

IN THE SPECIFICATION:

Page 1, amend the paragraph beginning on line 1 to read as follows:

The invention relates to a device for moistening a material web moved in the transport direction, preferably for re-moistening a paper or textile web dried after printing by means of a spray device for spraying a water mist on the material web under the influence of an electrostatic field generated by an electrostatic charging device according to the preamble of the main claim.

Page 1, amend the paragraph beginning on line 13 to read as follows:

The goal of the invention is to improve a device according to the species according to the preamble of the main claim for moistening a material web moved in a transport direction by means of a spray device for spraying a water fog onto the material web under an influence of an electrostatic field generated by a device for electrostatic charging so that a high degree of moistening can be achieved with small installation sizes.

Page 1, amend the paragraph beginning on line 16 to read as follows:

This goal is achieved in a device according to the species according to the preamble of the main claim according to the invention by these characterizing features by providing a reversing roller for reversing the material web in the transport direction upstream of the spray device, the reversing roller having associated with it a device for electrostatic charging designed as a corona-charging electrode, the spray device having

two water spray heads located on both sides of the material web.

IN THE CLAIMS:

1. (Amended) Device for moistening a material web (4) moved in a transport direction (v) ~~preferably for re-moistening of a paper or textile web dried after printing by means of a spray device (6) for spraying a water fog onto the material web (4) under the influence of an electrostatic field generated by a device for electrostatic charging (1) characterized in that
 - a reversing roller (3) for reversing the material web (4) is provided in the transport direction (v) upstream of the spray device (6),
 - that the reversing roller (3) has associated with it a device for electrostatic charging designed as a corona-charging electrode (1),
 - and that the spray device has two water spray heads (6) located on both sides of the material web (4).~~
2. (Amended) Device according to Claim 1 characterized in that the reversing roller (3) has a smooth surface that is a good electrical conductor.
3. (Amended) Device according to Claim 2 characterized in that the reversing roller (3) is high-gloss chrome-plated.
4. (Amended) Device according to Claim 3 characterized in that the reversing roller (3) is grounded.
5. (Amended) Device according to Claim 1 characterized in that the jacket of reversing roller (3) has on top of the a jacket having a smooth outer surface and a thin coating provided on the smooth outer surface, preferably of polytetrafluoroethylene or

rislan.

6. (Amended) Device according to Claim 1 characterized in that the reversing roller (3) is wrapped around by the material web (4) in an angle range that forms at least a right angle.

7. (Amended) Device according to Claim 1 characterized in that the corona-charging electrode (1) is located in the a plane spanned by the an axis of the reversing roller (3) and the a tangent line in the an area in which the material web (4) runs onto the a jacket of the reversing roller (3).

8. (Amended) Device according to Claim 1 characterized in that the water spray heads (6) directed at the surface of the material web (4) are grounded.

9. (Amended) Device according to Claim 8 characterized in that the two water spray heads (6) are located opposite one another on the two sides of the material web (4).

IN THE ABSTRACT:

~~The invention relates to a~~ A device for moistening a material web moved in the transport direction, is preferably used for re-moistening a paper or textile web dried after printing by means of a spray device for spraying a water fog onto the material web under the influence of an electrostatic field produced by a device for electrostatic charging ~~characterized by the fact that~~ The device includes

- a reversing roller is provided in the transport direction upstream of the spray device for deflecting the material web,
- that the The reversing roller has associated with it a device designed as a corona-

charging electrode for electrostatic charging;
—and that the spray device has two water spray heads located on both sides of the material web.